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Case report

Paediatric duodenal haematoma: Nonoperative management of blunt traumatic injury

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ABSTRACT

Trauma is the leading cause of morbidity and mortality in the paediatric population. Following the head and extremities, the abdomen is the third most commonly injured anatomic region in children [1]. We present a case of a massive duodenal haematoma secondary to blunt trauma that was managed nonoperatively. Several cases reports in the literature cite successful nonoperative management of duodenal haematoma by nasogastric decompression, bowel rest, and total parenteral nutrition [4], with resumed eating an average of 16 days after injury [9]. However, if the abdominal pain or obstruction fail to improve and/or resolve with medical management over seven to ten days, complications such as infarction or peritonitis are frequent, and surgical intervention may be required [3].

1. Introduction

Trauma is the leading cause of morbidity and mortality in the paediatric population. Following the head and extremities, the abdomen is the third most commonly injured anatomic region in children [1]. We present a case of a massive duodenal haematoma secondary to blunt trauma that was managed nonoperatively. This is a prime example where significant life-long morbidity from surgical intervention was avoided with successful conservative management.

2. Case presentation

The patient is a 15 year-old male without significant medical history who presented to emergency department for nausea and abdominal pain. He sustained blunt abdominal injury from a violent football tackle seven hours prior. On arrival, vital signs included blood pressure of 149/77, pulse of 149 beats/min, respiratory rate of 18 breaths/min, and O_2 saturation of 100% on room air. Physical examination disclosed Glasgow coma score of 15, total trauma score of 12, and an abdomen with diffuse tenderness greatest at the epigastrium. Initial upright chest X-ray was without signs of free air, and subsequent computed tomography showed no extraluminal air, no portal venous gas, a normal appearing pancreatic head and uncinate process, and pooling of contrast in stomach with a large haematoma in the second and third portions of the duodenum, yet still some contrast in distal small bowel. Stat laboratory results were significant for white blood cell count of 12.1×10^3 cells/μL (4×10^3 cells/μL–13×10^3 cells/μL), total bilirubin 1.8 mg/dL (0.2–1.0 mg/dL), alkaline phosphatase 125 units/L (65–260 units/L), amylase 125 units/L (25–115 units/L), and lipase 2093 units/L (73–393 units/L). The patient was given resuscitative intravenous fluids, analgesics for symptomatic relief, and had a 16-French nasogastic (NG) tube inserted for gastric decompression. Subsequently he was admitted to the intensive care unit for observation (Figs. 1–3).

On hospital day one the patient had a upper gastrointestinal (UGI) series that exhibited increased oedema, and an acute gastric outlet obstruction in the junction of the second and third segments of the duodenum, consistent with the diagnosed duodenal haematoma without perforation. Total parenteral nutrition (TPN) was started on hospital day two. By hospital day four, although the patient continued to experience nausea, his pain was markedly improved and he started passing flatus and stool. Repeat UGI study through NG tube on hospital day 12

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Fig. 1. The computed tomography clip shows massive duodenal haematoma comprising almost the entire right hemi-abdomen. Some contrast is seen in distal small bowel, as patient was initially without a compete gastric outlet obstruction.

showed a grossly normal stomach, and confirmed the severe narrowing of the duodenal lumen. However, there was a small amount of contrast seen passing into the jejunum exhibiting improvement relative to the initial study, with appropriate recovery. On hospital day 13 given clinical improvement and normalizing laboratory values, the patient was discharged home with prescriptions for TPN, directives for the NG. and instructions for limited activity. Outpatient follow-up at one month with repeat upper UGI showed significant symptomatic and radiographic improvement of haematoma. The patient had tolerated two weeks of oral intake, and the TPN weaned off at this time. By the two month follow-up appointment there was clinical resolution of duodenal haematoma, with appropriate oral intake and without long term complications.

3. Discussion

Serious abdominal injury accounts for approximately eight percent of admissions to paediatric trauma centers [8]. The paediatric abdomen is more vulnerable to trauma when compared to the adult counterpart. Anatomically there is a theorized two fold reason for the disadvantage, as the thin musculature of the child abdominal wall provides reduced organ protection, and immature ribs possess a greater compliance, decreasing likelihood of fracture, and thus also decreasing the efficacy to dissipate forceful energy and protect the abdominal contents [7].

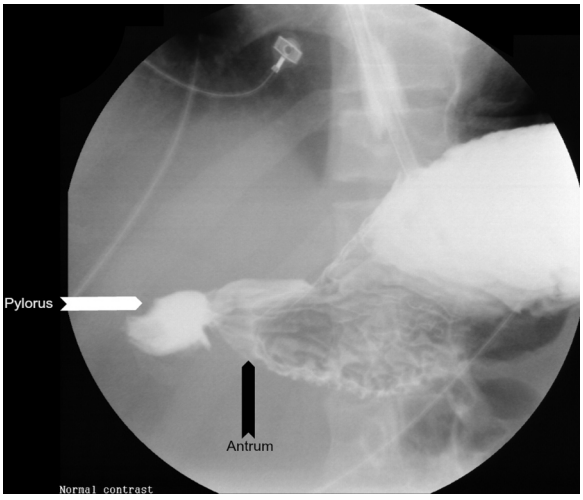

Fig. 2. The UGI clip was taken from the study performed on day one after the injury, showing increased oedema and an acute gastric outlet obstruction secondary to the duodenal haematoma.

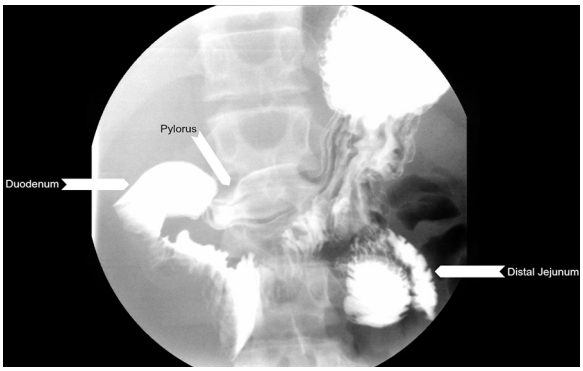

Fig. 3. The UGI clip was taken from the study performed at one month follow-up, showing resolution of gastric outlet obstruction.

The differential diagnosis with duodenal injuries must include concomitant pancreatic and/or biliary tract injury due to direct trauma or to obstruction of the ampulla [6]. While the vast majority of hollow organ injuries require operative intervention, the rare duodenal haematoma, is the notable exception [10]. Frequently, they occur in the second and third segments of the duodenum, owing to the relatively fixed position and the rich submucosal vascular supply [5]. An excess of 6 L/day of fluid normally passes through the duodenum, and thus fistulas/perforations in this location can result in life threatening electrolyte imbalances, and large amounts of activated enzymes in the retroperitoneal space and/or peritoneal cavity [2]. Several cases reports in the literature cite successful nonoperative management of duodenal haematoma by NG decompression, bowel rest, and TPN [4], with resumed eating an average of 16 days after injury [9]. However, if the abdominal pain or obstruction fail to improve and/or resolve with medical management over seven to ten days, complications such as infarction or peritonitis are frequent, and surgical intervention may be required [3]. Operative intervention for a duodenal haematoma consists of exploratory laparotomy with evacuation and closure of the serosal incision. If duodenal perforation is discovered on exploration, surgical intervention can range from repair with primary closure to primary reanastomosis to jejunal serosal patch to the very last resort of pancreaticoduodenectomy [2]. As illustrated in the case provided, even massive duodenal haematomas can be managed nonoperatively, and more importantly, the resulting decrease in morbidity from operative intervention is avoided.

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